ABB DC Drives
DCS800-A Enclosed Converters
18 A to 9800 / 19600 A
## DCS800 Drive Manuals

### DCS800 Quick Guide
- Public number: 3ADW000191
- Language: E, D, I, ES, F, CN, RU, PL, PT, SE

### DCS800 Tools & Documentation CD
- Public number: 3ADW000211
- Language: E, D, I, ES, F, CN, RU, PL, PT, SE

## DCS800 Converter module
- Flyer DCS800: 3ADW000190
- Technical Catalog DCS800: 3ADW000192
- Hardware Manual DCS800: 3ADW000194
- Hardware Manual DCS800 update DCF503B/DCF504B: 3ADW000194Z
- Firmware Manual DCS800: 3ADW000193
- Installation according to EMC: 3ADW000032
- Technical Guide: 3ADW000163
- Service Manual DCS800: 3ADW000195
- 12-Pulse Manual: 3ADW000196
- CMA-2 Board: 3ADW000213
- Flyer Hard - Parallel: 3ADW000213

## Drive Tools
- DriveWindow 2.x - User's Manual: 3BFE64560981
- DriveOPC 2.x - User's Manual: 3BFE00073846
- Optical DDCS Communication Link: 3AFE63988235
- DDCS Branching Units - User's Manual: 3BFE64285513

## DCS800 Applications
- PLC Programming with C: 3ADW000199
- 61131 DCS800 target + tool description - Application Program: 3ADW000199

## DCS800 Crane Drive
- DCS800 Crane Drive Manual suppl.: 3AST004143
- DCS800 Crane Drive Product note: PDCS EN

## DCS800 Winder ITC
- DCS800 Winder Product note: PDC2 EN
- DCS800 Winder description ITC: 3ADW000308
- Winder Questionnaire: 3ADW000253Z

## DCS800-E Panel Solution
- Flyer DCS800-E Panel solution: 3ADW000210
- Hardware Manual DCS800-E: 3ADW000224

## DCS800-A Enclosed Converters
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- DCS800-R DCS500/DCS600 Upgrade Kits: 3ADW000256

## Extension Modules
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- KIT0-01 Digital IO Extension: 3AFE64485733
- RRA0-01 Resolver Interface Module: 3AFE68570760
- RTAC-01 Pulse Encoder Interface: 3AFE64468583
- RTAC-03 TTL Pulse Encoder Interface: 3AFE6850500
- AIMA R-slot extension: 3AFE64616442

## Door mounting kits
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- Door mounting DCS Control Panel (fix mounting): 3AFE88294673
- Door mounting DCS Control Panel (IP66, fix mounting): 3AFE88283953

## Serial Communication
- Drive specific serial communication
- NTA Remote diagnostic interface: 3AFE64605062
- Fieldbus Adapter with DC Drives RPBA- (PROFIBUS): 3AFE64504215
- Fieldbus Adapter with DC Drives RCAN-02 (CANopen)
- Fieldbus Adapter with DC Drives RCNA-01 (ControlNet)
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Status 01.2015

DCS800 Manuals-list e m.docx
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Latest Technology, High Performance and a User-Friendly Concept

DCS800-A are DCS800 converter modules mounted in an enclosure. The series is a complete range of enclosed converters intended for the supply and control of DC machines. DCS800-A provides maximum flexibility in the firmware, the drive itself is programmable as well as a serial communication (e.g. Profibus) interface plus 12-pulse parallel, serial and sequential. DCS800-A enclosed converters are fully digital. Optional equipment is available to meet different safety standards. The converter can be used for standard applications but has the flexibility to be customized for the most demanding applications.

Comprehensive Product Range

DCS800-A enclosed converters are available as 6-/12-pulse and in 2- or 4-quadrant, with current ranges from 18 to 9800/19600 A and supply voltages of 230 ... 990 (1200) V AC. A selection of options is available to provide the user with a system meeting the most demanding technical requirements and performance expectations. Common control electronics throughout the product range reduces spare parts inventory and training requirements.

DCS800-A Concept

- A single drive control technology is available for a wide power range to reduce training costs and meets the requirements of various applications.
- Common AC busbar designs for group drives are available for the most cost-efficient and functional system structure.
- Incoming supply section for group drives can be equipped with air circuit breakers or insulation switches.
- Control cubicles offer various I/O solutions in combination with ABB controls e.g. AC800M.
- Approval for many application specific standards (e.g. ABS, DNV, Loyd, UL, CSA) can be ordered as option.
- Flexible design of power cable entry provide simple installation and minimum power down time especially for upgrades.

Digital Control

To meet the most stringent control requirements, the DCS800-A features speed control, which reduces the effects from gear backlash and torsional vibration arising in mechanical systems. High-performance speed and torque control will fulfill all requirements for rapid response and high control accuracy. Autotuning for armature, field current and speed controller simplifies the commissioning.

What is a DCS800 DC drive?

The DCS800 DC Drive is simple to buy, install, configure and use, saving considerable time.
- Precise delivery
- Quick installation
- Rapid start-up

The drive has common user and process interface with fieldbus, common software tools for sizing, commissioning, maintenance and common spare parts.

Where can it be used?

DCS800 can be used in the wide range of all industrial application of
- Metals
- Pulp & Paper
- Material handling
- Test rigs
- Food & Beverage
- Printing
- Plastic & Rubber
- Vessels
- Ski lifts
- Magnets
- Mining
- Electrolysis
- Battery Chargers
- and more

DCS800 DC drive promises

The drive meet the requirement of all demanding drive application like:  • testrig • mine hoist • rolling mill as well as none motoric applications like: electrolysis • magnetics • battery charger

Embedded software functions offer the upgrades of all classic installations 12-pulse, shared motion, double motor operation, field reversal control.
Highlights
- Assistant control panel providing intuitive use of the drive.
- Excellent control performance up to highest dynamic application in field weakening operation.
- All ACS800 PC tools (via DDCS) can be connected
- Reduced installation and commissioning work.
- Internal three phase field exciter without additional external hardware.
- Prepared for additional software function by adaptive programming and IEC61131 programming.
- Flexible fieldbus system with built-in Modbus and numerous internally mountable fieldbus adapters.

Software Tools
Start-up assistant
Faster and easier commissioning
The Start-up assistant serves in DCS800 DC Drives. It guides you actively through the commissioning procedure either by the control panel or ABB PC tools. It is multilingual, requests data with clear and plain text messages, and sets the required parameters to your needs.

IEC 61131 programming
ControlBuilder DCS800
The ControlBuilder is a user-friendly tool based on the IEC61131-3 standard for programming the DCS800. With the ControlBuilder it is possible to develop - in a fast and easy way - new function e.g. winders, decentralized controls, safety functions, ... directly in the drive.

Fieldbus control
Gateway to your process
DCS800 DC Drives have connectivity to major automation systems. This is achieved with a dedicated gateway concept between the fieldbus systems and ABB drives. The fieldbus gateway module can easily be mounted inside the drive. As a result of the wide range of fieldbus gateways, your choice of automation system is independent from your decision to use first-class ABB drives.

Start-up and maintenance tool
DriveWindow Light 2 PC tool for ABB drives
DriveWindow Light 2 is an easy-to-use start-up and maintenance tool for ABB drives. Supported drives are ACS140, ACS160, ACS350, ACH400, DCS550, ACS550, ACH550, DCS800 and ACS800.
- Viewing and setting parameters in offline and online mode
- Editing, saving and downloading parameters
- Comparing parameters
- Graphical and numerical signal monitoring
- Drive control
- Start-up assistants
- DWL AP tool for DCS800
- All DCS800 DC drives are equipped with DriveWindow Light

Start-up, maintenance and integration
DriveWindow 2
ABB’s DriveWindow is an advanced, easy-to-use PC software tool for the start-up and maintenance of ABB DCS800 DC Drives. Its host of features and clear, graphical presentation of the operation make it a valuable addition to your system providing information necessary for troubleshooting, maintenance and service, as well as training.

With DriveWindow the user is able to follow the co-operation of several drives simultaneously by collecting the actual values from the drives onto a single screen or printout.

DriveOPC
Integration tool
DriveOPC is a software package which allows OLE for Process Control (OPC) communication between Windows applications and DCS800 DC drives. It allows Object Linking and Embedding (OLE) for Process Control (OPC) communication. This OPC server is an ideal tool for integrating DCS800 DC drives and commercial PC software and creating PC-based controlling and monitoring systems.
Description of DCS800-A Enclosed Converters

Mechanics
The robust and strong frame body of the cabinets is made from steel with a thickness of 2.5 mm and all metal sheets are softline design to avoid accidents and are 1.5 mm thick. A basic protection against corrosion is given by a hot zink galvanisation of all metal work. The standard height is 2120 mm (height is including detachable hood (120 mm)) with various widths (200/400/600/800/1000 mm) and depths (600) depending on the power and the size of the converter.

All dimensions in mm.
Incoming Supply Sections for Group Drives

Incoming supply sections (DCA63x) are used to supply several group drives connected by horizontal busbars. The connection to the AC supply can be made by cables or busbars. The cable / busbar entry is at the bottom of the incoming supply section as standard.

The incoming supply section can be located preferable left side of line-ups, but also right side and even in the middle of line-ups.

The cabinets standard protection class is IP21.

Basic design

- Rated voltage: 400, 500, 600, 690 V
- Rated frequency: 50 or 60 Hz
- Rated current: 1000, 2000, 3000, 4000 A AC
- Short circuit ratings: 50 kA (1 sec.)
  \[ i_{\text{dyn}} = 105 \text{ kA (peak)} \]

Options

- Cabinet design according to EMC-regulations
- Isolation Switch (DCA631)
- Air circuit breaker (DCA632)
- Earthing switch
- Residual Current Detection
- AC Current Measurement
- AC Voltage Measurement
- Arc Detecting Relay
- Emergency stop relays, tripping circuits

DCS800-A enclosed converters

DCS800-A enclosed converters are suitable for three-phase supply voltages from 230 V to 990 (1200) V, 50 or 60 Hz. The rated DC current range is from 18 to 9800 / 19600 A.

DCS800-A enclosed converters with rated DC current from 18 A up to 1850 A are available in two different layouts:
- Single drive configuration without horizontal busbars therefore AC cable connection
- Group drive configuration with horizontal busbars (size-depending on rated amps)

Group drives from sizes D6 and D7 on request.

DCS800-A can be tailored to meet different needs by using combinations of the following options:
- Earth Fault Detection (current sensitive)
- Insulation Monitor (voltage sensitive)
- Motor Fan Starter
- Galvanic Isolation of converter voltage measurement
- Cabinet design according to EMC-regulations
- EMC Filters
- Protection Class IP 21-Standard
- Protection Class IP 31 with filter (insect screen) in air inlet and outlet
- Protection Class IP 42 with filter in air inlet; air outlet same as IP 21
- IP 54 on request
- Gland plate and bottom plate
- Special Colour (only outside) acc. to RAL standard
- Heater
- Lighting
- Horizontal Busbars

Important!

CE mark requires the options
- EMC procedure / part list check
- EMC filter or dedicated transformer (performed by the customer)
- Cable marking A2 plus

EN61800-3 (IEC 1800-3) standard requires the options
- EMC procedure/part list check
- EMC filter or dedicated transformer (performed by the customer)
Field Exciters
Several Solutions available
- Ratings from 6 to 450 A • Integrated, separate or external
- 2-phase or 3-phase versions • 1-; 2-; 4-Quadrant • Digital control • Auto/manual tuning

The field exciters are controlled via a serial DCSLink with a speed of 500 kBaud for fast and accurate control.

Internal field exciters
Field exciters from 6 A up to 25 A can be included in armature converter modules up to 500 / 525 V, 2000 A (Size D5).

On board field exciters are 3-phase half controlled field exciters 6 A / 15 A / 20 A / 25 A in D1 up to D4 converter modules (525 V). These field exciters are directly supplied from mains circuit internally and do not require any autotransformer in three-phase operation.

FEX425 field exciter is also a 25 A 3-phase half controlled unit assembled in a D5 converter module. It can be supplied directly from mains circuit or from a separate field supply voltage.

DCF803-0050
2-phase, 1-quadrant, half controlled, outside the converter module. An autotransformer is optional to reduce voltage ripple in the field circuit by adapting the AC voltage to a suitable level.

DCF804-0050
2-phase, 4-quadrant, full controlled, field exciter for field reversal. An autotransformer is optional to reduce voltage ripple in the field circuit by adapting the AC voltage to a suitable level.

DCS800 Converter modules
Basic design
All units are provided with the same digital control board and software. The DCS800 flexibility allows the user to configure functions of the drive easily, suitable for different applications. Functions of the DCS800 are normally activated by parameters.

The basic software includes following options:
- Processing the speed reference with a speed ramp generator (S-ramp capability, accel/decel ramp)
- Processing the speed feedback
- Current controller
- Field weakening
- Automatic/manual field reversal
- Autotuning of current controller
- Autotuning of speed controller
- Speed monitor
- Drive control logic
- Remote/local operation
- Emergency stop
- Electronic circuits are not sensitive to line phase sequence
- Motor overload protection
- Dual field
- Programmable analog outputs
- Field supply
- Master/follower via fibre optics
- 12-Pulse link

Monitoring functions
- Self-test
- Fault logger
- Motor protection
- Power converter protection
- Incorrect supply protection

I/O’s of the converter module
The I/O connections in the DCS800 converter modules are used for safety and other drive specific functions like emergency stop and motor temperature measurement:
- 1 analog tachometer input
- 4 analog inputs
- 2 voltage reference outputs
- 3 analog outputs
- 1 actual armature current output
- 1 pulse encoder input (with IOB-3 isolated)
- 8 digital inputs
- 7 digital outputs

More detailed information about SDCS-IOB-2x/3 see Hardware manual DCS800.
DCS 800 Marine drive design (group drives)

DCS800-A Marine Drive

Typical Applications for Marine Drives
The DCS800-A marine cabinet is designed for standard marine applications like ships and oil rigs. The typical applications are propulsion, thrusters, mud pumps, draw works, rotary tables and top drives.

Ordering
The standardized and type-approved design of DCS800-A Enclosed Converters allow DNV Certification of the complete cabinet line up. The DCS800-A marine cabinets include all components which are necessary for a standard marine drive application. A converter type of either 2-Q (single bridge) or 4-Q (double bridge) can be selected. Footprint 800 x 800 mm meets requirement of original converter. The DCS800-A marine cabinets have a footprint of 800 x 800 mm. If motor assignment breakers or cable connection from top are required the footprint can be extended to a depth of 1200 mm.

Scope of delivery
- Type tested design and equipped DNV marine approval:
- 45°C ambient temperature
- IP22
- Marine hand grips and door stoppers
- IEC 332-3 flame retard cable

2-Q and 4-Q DCS800 drives
- 50 A or 60 A field exciter
- Options: RDIO/RAIO I/O Extension modules

DCA650 Control Cabinet
ABB controller AC 800 • Fieldbus interface FCI (AF100)
- Location of full range of S800 I/O modules.

Advant controller and S800 I/O System
The S800 I/O system consists of the control module (FCI, AC 800M), digital and analog I/O modules. The control module has a connection to several different bus systems and optical channels to connect the drives. The modules are located on mounting rails (DIN).

AF 100 field bus interface FCI
Within this AF 100 interface up to 12 drives can be connected.

Advant controller AC 800M
Powerful controller with several fieldbus interfaces. Up to 12 drives can be connected with the optical module bus. The above mentioned control modules can also handle up to 12/24 I/O modules.

Digital inputs and outputs
8 channels • input voltages from 24 V ... 250 V

Analog inputs and outputs (12 bit resolution)
8 channels

Drive Bus Communication
The Drive Bus Communication module CI854 provides another fast optical DDCS communication channel to the drives

Safety functions
Many different kinds of safety functions are available and requirements differ from application to application.

Safety functions are always an option.

Safety circuits, including safety relays, will be included according to customer specification.
Overview Enclosed converter DCS800-A-0020 ... 0350 (D1/D2/D3-350)

Component list (standard)
- Degree of protection: IP 21
- Armature converter module: U1
- Isolation switch with semiconductor fuses: Q1
- Main contactor: K1
- Line reactor: L1
- Internal excitation: On-board 6 - 15 A: A22
- Process terminals: X1/X6/X7
- Aux. supply voltage transformer: T2
- Aux. supply voltage fuses: F2
- Converter fan fuse: F4
- Auxiliary circuit fuse: F5
- Converter fan relay: K8
- E - stop relay: K15
- Electrical disconnect relay: K16
- I/O board SDCS-IOB-2x: A9
- I/O board SDCS-IOB-3: A10

Note 1: On-board field exciter keeps main contactor ON during field heating
Note 2: * Wiring see section Basic circuit diagrams.

Component list (options)
- Excitation contactor: K3
- Excitation line reactor: L3
- Excitation fuse: F3
- Excitation autotransformer: T3
- Excitation unit DCF803/804: U3
- Residual current detection: T1
- Motor fan starter contactor: K6
- Motor fan starter thermal overload: F60
- Motor fan starter fuses: F6
- Advant controller: AC 800M
- 24 VDC power supply: G1

Note 3: Not all options are shown. For more options see section Mechanical options and Electrical options!
Note 4: For more details (e.g. losses and weight) see tables on page 43 and 44.

Note 5: All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.
Component list (standard)

- Degree of protection: IP 21
- Armature converter module: U1
- Isolation switch with semiconductor fuses: Q1
- Main contactor: K1
- Auxiliary relay: K10
- Line reactor: L1
- Internal excitation: On-board 20 - 25 A
- Process terminals: X1/X6/X7
- Aux. supply voltage transformer: T2
- Aux. supply voltage fuses: F2
- Converter fan fuse: F4
- Auxiliary circuit fuse: F5
- Converter fan relay: K8
- E - stop relay: K15
- Electrical disconnect relay: K16
- I/O board: SDCS-IOB-2x A9
- I/O board: SDCS-IOB-3 A10

Note 1: On-board field exciter keeps main contactor ON during field heating
Note 2: * Wiring see section Basic circuit diagrams.

Component list (options)

- External excitation: DCF803/804
- Excitation contactor: K3
- Excitation fuse: F3
- Excitation autotransformer: T3
- Residual current detection: T1
- Motor fan starter contactor: K6
- Motor fan starter thermal overload: F60
- Motor fan starter fuses: F6
- Advant controller: AC 800M
- 24 VDC power supply: G1

Note 3: Not all options are shown. For more options see section Mechanical options and Electrical options!
**Note 4:** For more details (e.g., losses and weight) see tables on page 43 and 44

**Note 5:** All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.
Overview Enclosed converter DCS800-A-(900)1200 ... 2000 (D5)

Component list (standard)
- Degree of protection IP 21
- Armature converter module U1
- Circuit breaker Q1
- Isolation switch with fuses for aux. supply voltage Q10
- Auxiliary relay K10
- Line reactor L1
- Process terminals X1/X6/X7
- Aux. supply voltage transformer T2
- Aux. supply voltage fuses F2
- Converter fan fuse F4
- Auxiliary circuit fuse F5
- Converter fan relay K8
- E - stop relay K15
- Electrical disconnect relay K16
- I/O board SDCS-IOB-2x A9
- I/O board SDCS-IOB-3 A10

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section Basic circuit diagrams.

Component list (options)
- Internal field exciter FEX425 INTERNAL 25 A
- External excitation DCF803/804 U3
- Excitation contactor K3
- Excitation fuse F3
- Excitation autotransformer T3
- Residual current detection T1
- Motor fan starter contactor K6
- Motor fan starter thermal overload F60
- Motor fan starter fuses F6
- Advant controller AC 800M
- 24 VDC power supply G1

Note 3: Not all options are shown. For more options see section Mechanical options and Electrical options!
Note 4: For more details (e.g., losses and weight) see tables on page 43 and 44.
Note 5: All enclosed converters are available as group and single drives. Group drive require the option horizontal busbars.
Note 6: For easy connection of cables use additional incoming cabinet DCA635 (see section Incoming DCA635).
Overview Enclosed converter DCS800-A-2050 ... 3000 (D6 ≤ 690 V)

Component list (standard)
Degree of protection IP 21
Armature converter module U1
Circuit breaker Q1
Isolation switch with fuses for aux. supply voltage Q10
Auxiliary relay K10
Process terminals X1/X6/X7
Aux. supply voltage transformer T2
Aux. supply voltage fuses F2
Converter fan fuse F4*
Auxiliary circuit fuse F5*
Converter fan relay K8*
E - stop relay K15*
Electrical disconnect relay K16*
I/O board SDCS-IOB-2x A9*
I/O board SDCS-IOB-3 A10*

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section Basic circuit diagrams.

Component list (options)
Excitation U3/K3
DCF803/804; to 50 A
or
DCS800-S01/S02; 25 ... 350
plus DCF506 - Overvoltage protection

Line reactor L1
Aux control of HSDC-breaker
Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.

Single line diagram DCS800-A-2050 ... 3000
400 V ... 690 V with breaker
Overview Enclosed converter DCS800-A-1900 ... 3000 (D6, 790 V)

Component list (standard)
Degree of protection IP 21
Armature converter module U1
Isolation switch with fuses for aux. supply voltage Q10
Auxiliary relay K10
Process terminals X1/X6/X7
Aux. supply voltage transformer T2
Aux. supply voltage fuses F2
Converter fan fuse F4
Auxiliary circuit fuse F5
Converter fan relay K8
E - stop relay K15
Electrical disconnect relay K16
I/O board SDCS-IOB-2x A9
I/O board SDCS-IOB-3 A10

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.
Note 2: * Wiring see section Basic circuit diagrams.

Component list (options)
Excitation U3/K3
DCF803/804; to 50 A
or
DCS800-S01 / S02; 25 ... 350
plus DCF506 - Overvoltage protection

Aux control of HSDC-breaker
Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.
Overview Enclosed converter DCS800-A-2050 ... 3300 (D7)

Component list (standard)

Degree of protection IP 21
Armature converter module U1
Isolation switch with fuses for aux. supply voltage Q10
Auxiliary relay K10
Process terminals X1/X6/X7
Aux. supply voltage transformer T2
Aux. supply voltage fuses F2
Converter fan fuse F4
Auxiliary circuit fuse F5
Converter fan relay K8
E - stop relay K15
Electrical disconnect relay K16
I/O board SDCS-IOB-2x A9
I/O board SDCS-IOB-3 A10

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section Basic circuit diagrams

Note 3: Circuit breaker Q1 on request

Component list (options)

Excitation U3/K3
DCF803/804; to 50 A
or
DCS800-S01 / S02; 25 ... 350
plus DCF506 - Overvoltage protection

+P907 U1 control located in control cubicle (swing frame)

Aux control of HSDC-breaker
Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.
Overview Enclosed converter DCS800-A-4000 ... 5200 (D7)

Component list (standard)
- Degree of protection: IP 21
- Armature converter module: U1
- Isolation switch with fuses for aux. supply voltage: Q10
- Auxiliary relay: K10
- Process terminals: X1/X6/X7
- Aux. supply voltage transformer: T2
- Aux. supply voltage fuses: F2
- Converter fan fuse: F4*
- Auxiliary circuit fuse: F5*
- Converter fan relay: K8*
- E-stop relay: K15*
- Electrical disconnect relay: K16*
- I/O board SDCS-IOB-2x: A9*
- I/O board SDCS-IOB-3: A10*

Note 1: This standard list does not include any options or the excitation! Please choose the excitation from the options list.

Note 2: * Wiring see section Basic circuit diagrams

Note 3: Circuit breaker on request

Component list (options)
- Excitation: U3/K3
- DCF803/804; to 50 A
- or
- DCS800-S01 / S02; 25 ... 350
- plus DCF506 - Overvoltage protection
- Circuit breaker Q1
- +P907 U1 control located in control cubicle (swing frame)
- Aux control of HSDC-breaker
Note 3: Drive without line choke L1. Designed to be connected to dedicated transformers.
Overview Enclosed converter Series D7P in Large Drive design

Configuration of 12-pulse parallel (12-pulse master and follower) in combination with hard parallel (paralleling master and slave)

Layout of DCS800-A0x-9600-xxPD + three-phase field exciter (as option)
DCS800-A Enclosed Converters Technical catalog e e | 3ADW000198R0501 25

DCS800-A Mechanical options

CE mark
Requires options of EMC regulation and cable marking.

- EMC procedure according to part list check
  for Converters 25 A up to 5200 A.
  The DCS800-A converters and their options do not require
  an EMC-modified cabinet.
  Note: see also Technical Guide 3ADW000163
- Marking of conductors
  Conductors, cables and busbars are provided with either
  Standard Marking or Special Marking as an option.

Three different cable markings are available
- Standard Marking (not sufficient for CE mark) the main
  circuit input and output connections and the ribbon cables
  are marked. Marking is made by imprints, adhesive labels,
  pliotex PT-V rings or equivalent.

Class A2 plus
This cable marking complies with Standard EN60204 for CE
marking.
Conductors between
- converter module and
- apparatus (e.g. contactor, switch)
are marked with terminal numbers

<table>
<thead>
<tr>
<th>K1</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
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The marking is done for long conductors and short obvious
conductors.

- Class B1
  In addition to the marking A2 cable marking provides the
  apparatus symbols.

<table>
<thead>
<tr>
<th>K1</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td></td>
<td>K1</td>
<td>K2</td>
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</tbody>
</table>

Standard Design is IP21
Air inlet 8 mm longitudinal slots, air outlet same as air inlet
plus a air ventilation hood on the top.

Insect screen in air inlet / outlet (IP31)
To clean the incoming air in dirty environment. Only in
combination with gland plate and bottom plate.
Insect screens reduce the rated current of the enclosed
converters. The reduction is calculated by DC DriveSize.

Air inlet filters (IP41)
Air input IP41, air output standard IP21.
To clean the incoming air in dirty environment. Only in
combination with the option gland plate and bottom plate.
Air inlet filters reduce the rated current of the enclosed
converters. The reduction is calculated by DC DriveSize.

IP54R
The IP54R cabinet designed (option) to allow cooling by supply air duct of
a recirculation air cooling system. The air entry (left or right side) and
the air exit (top) are realized by rectangular flanges (400 x 600 mm).
Ventilation shafts of the supply air
duct to the air water recirculation heat exchanger are
connected to these flanges.

Gland plate and bottom plate
Cable glands for control-, field- and AC cables located in the
bottom plate.

Bottom plate (without cable holes)
The cable holes must be drilled by the customer.

Bottom plate with conductive sleeves (according to EMC)
Bottom plate are equipped with conductive sleeves which
provide simple cable screen connection. The bottom plate is
not required for CE mark.

Special color (according to RAL standard)
Standard color is light grey RAL7035. Outside color of a
cabinet can be chosen freely according to RAL standard.
Special colors on request.

Key lock
For this doors
- a triangular key is standard
- a safety key lock is an option.

End panels
End panels have to be chosen to make a complete cabinet.
For a line-up only one pair of panels is needed.
Horizontal AC busbars
Horizontal busbars are used to feed the entire line-up from the incoming supply section.
- without AC busbars => single drive
- copper (tin plated possible), 1000 A_{AC} => group drives
- copper (tin plated possible), 2000 A_{AC} => group drives
- copper (tin plated possible), 3000 A_{ACmax} => group drives
Current rating depends on the power needed. Maximum current is 3000 A for horizontal AC-busbars. 4000 A incoming sections should be placed in the middle of a line up, in order to distribute the AC-current to left and right side.

AC cable connection for single drives
- Bottom entry/exit is standard and is included in converter basic design.
- Top entry/exit on request (needs additional engineering).

Control cable connection
- Bottom connection is standard and is included in converter basic design.
- Top connection on request.

Air circuit breaker
- Air circuit breaker is optional for drives with 4000 A and 400 ... 690 V_{AC}.
- Air circuit breakers for more than 690 V_{AC} or \( \geq 4800 \) A on request.

DCA680 Additional empty cabinets (without end panels and bottom plate)
Empty cabinet without end panels are available.
- Depth 600 mm:
  - 200 mm - busbar joining cabinet to connect shipping splits
  - Depth 600 mm *:
    - 400, 600, 800, 1000 mm - empty cabinet

* Bottom plate with conductive sleeves as option
  Bottom plate are equipped with conductive sleeves which can provide simple cable screen connection.

Note1:
If a line up is splitted into several transportation segments an additional joining cabinet is needed per segment (except the last segment) for connection.

Note2:
Max. length of one transportation segment is 3.40 m.

EMC-Filters for drives cabinets
- Located in separate cabinet next to drive cabinet. Separate cabinet (on request).
- Instead of EMC filters a dedicated transformer can be used.

12-Pulse Configuration parallel, serial, sequential
The converters can be ordered with connection between 12-pulse master and 12-pulse follower.
For the 12-pulse serial the emergency short circuit busbars are available.

12-pulse parallel configuration available for:
- 20 A ... 5200 A, 230 ... 1000 (1190) V_{AC}

12-pulse serial and sequential configuration available for:
- 900 A ... 2000 A, 230 ... 345 V_{AC} per D5 converter
- 2050 A ... 5200 A, 230 ... 600 V_{AC} per D6, D7 converter

Serial sandwich configuration available for:
- 1900 A ... 3000 A, 230 V_{AC} ... 800 V_{AC} Per D6
- 2050 A ... 5200 A, 230 V_{AC} ... 1000 V_{AC} per D7

Note: see also Manual for 12-pulse operation 3ADW000115
Description of Electrical options

2-phase Field Exciters
(assembled in armature converter cabinet > 1000 A)
Package includes
- Field supply
  The field exciter for enclosed converter is a complete field supply package (except autotransformer). The two phase line reactor is included.
Package does not include
- Autotransformers
  An autotransformer is used to adapt the supply voltage of the single-phase field exciter and to reduce voltage ripple.
Available units
- DCF803-0035 35 A, single-phase or three-phase operation outside converter module maximum input voltage 600 V
- DCF803 30, 50 A, outside converter module
- DCF804 7, 16, 30, 50 A, outside converter module

Options for two-phase field exciters
- Autotransformers 400 V ... 690 V (single-phase)
  The maximum input voltage of 690 V for DCF803-0050 / DCF804-0050.
  Higher input voltages require an insulating transformer.
  An autotransformer is recommended for single-phase DCF803, if the rated field voltage of the motor is lower than 60 % of the rated field AC supply voltage.
- Two different sizes available.
  Transformer 3.0x; AC input 400 ... 500 V
  Transformer 3.1x; AC input 525 ... 690 V
  7 A - 57 A autotransformers. The autotransformer is selected according to the customer specification of the AC field supply voltage.

Note: In the standard design the field exciter is connected to the main supply.
Typing a different voltage into the AC FIELD SUPPLY (DC DriveSize) the wiring is automatically changed to external field supply terminals.

Safety circuits
Ordering STO and SS1 safety circuits according ordering guide page 48.

Interfaces

Fieldbus
Adapter for several fieldbus systems available (e.g. Profibus, Modbus, etc.)

I/O digital connection board
- SDCS-IOB-23 is the standard equipment for a DCS 800-A.
  Control voltage for relay outputs max. 230 V_{AC}
  Digital input voltage 230 V_{AC}
- Changing to SDCS-IOB-21 (option)
  Control voltage for relay outputs max. 230 V_{AC}
  Digital input voltage 24 / 48 V_{DC}
- Changing to SDCS-IOB-22 (option)
  Control voltage for relay outputs max. 230 V_{AC}
  Digital input voltage 115 V_{AC}

RDIO / RAIO I/O Extension modules
This plug-in option offers two additional relay outputs. They can be used, for example, in a Master-Follower application for interlocking functions. All the relays can be programmed to on/off by parameter. Alternatively, fieldbus can be used to control any external components in the system.

RDIO-01 Digital extension module
  3 x Digital Input
  2 x Digital Output (as relay)

RAIO-01 Analog extension module
  2 x Analog Input
  2 x Analog Output
  2 x Temperature measurement

AIMA Extension socket
I/O channel to AIMA-01 board together with SDCS-COM-8 board

DC Transducer
Additional measurement devices for customer signals
- PT 100 measurement device (230 V_{AC} supply is needed)
- PTC measurement device (Custorapid 230 V_{AC} supply is needed)
- DC-DC transducer (0 ... 10 V → 4 ... 20 mA; 24 V_{DC} supply is needed)
- DC-DC transducer (-10 ... +10 V → 4 ... 20 mA; 24 V_{DC} supply is needed)

Branching unit NDBU-95
The NDBU-95 is available in the armature converter cabinet, if no DCF803 / 804 and not in combination with 3-phase field exciter (DCS800-F0x) is used.
Separately the NDBU-95 is available in a 400 mm cabinet.
Other accessories

**Anticondensation heater of cabinet**
- 50 W heater per cabinet to prevent condensation. Supplied by 230 V AC from customer via terminals (X19).

**Lighting of the cabinet**
- LED lighting, including door contact. Supplied by 230 V AC / 115 V AC from customer via terminals (X19).

**Interface to external UPS**
- Separate 230 V AC input terminal to supply all necessary components for serial communication (including monitoring network [DW], branching unit NDBU), if the DCS800-A cabinet is switched off. 230 V UPS performed by customer.

**Plug socket**
- The plug socket is wired to 230 V AC customer terminal (X19) and the housing is according to German standard.

**Insulation monitor IRDH275-4 or IDRH375-4 (A90)** earth fault detection for isolated (IT) networks. An insulation monitor device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated. For detection of earth faults in both AC and DC circuits. Available for converter ratings 903 ... 5200 A. (25 ... 1000 A on request). The monitor can be mounted inside the cabinet or at the door. For redundant measurement 275 B type is an option.

**Galvanic isolation** necessary if there is any customer requirement and rated voltage from 790 V and higher (applicable for 2050 A ... 5200 A).
DCS800-A enclosed converters measure the actual voltage by means of high ohmic resistors. This measurement is according the IEC standard (2 Mohm for voltages starting at 790 V).
The option galvanic isolation is a complete isolation of this voltage measurement channels. This isolation is performed a by transformer for the AC voltage and a galvanically isolated transducer for the DC voltage. This option could also be required for 12-pulse serial/ sequential above 2 x 345 V AC.

**Motor fan starter**
Only one starter is possible in the standard design.
- D1 size (0020 ... 0140) 0.63 A ... 6.3 A
- D2/D3 size (0230 ... 0520) 0.63 A ... 12.5 A
- D4 ... D7 size (0680 ... 5200) 6.30 A ... 25A
For overload and short-circuit protection of an external AC (fan) motor such as a motor cooling fan. Available ratings are 0.63 ... 25 A, 400V, 500 V, 600 V, 690 V. The starter output is supplied by AC mains voltage or auxiliary voltage. There is no transformer included.
A second starter requires an additional cabinet DCA680.

=> Do not forget to fill in the current and voltage into DC DriveSize!

**Note:** In the standard design the motor fan is connected to the main supply. Typing a different voltage into the SUPPLY VOLT (DC DriveSize) the wiring is automatically changed to external fan supply terminals.
Option three phase field exciters assembled in armature circuit enclosed converter DCS800-A0x-1900 ... 5200

Field supply (DCS800-S0x-0020 ... 0350 converter modules, 230 ... 500 V AC + overvoltage protection)
Field exciters integrated in enclosed converters are available as packages. The packages includes all necessary parts (e.g. overvoltage protection DCF506, line reactor). Autotransformers for field supply assembled in an enclosed converter are excluded.
- All 3-phase field exciters have to be ordered separately.
- 3-phase field exciter (DCS800-F0x ... 0350 units) can be integrated in an armature cabinet together with converter units size D6/D7 (1900 ... 5200). More than 285 A / 300 A excitation are available in separate cabinets (s. chap. DCS800-A2x 3-phase field exciters in a separate cabinet).

In order to get a complete field supply following additional components have to be considered.

Auto- and insulating transformers
An autotransformer is used to have a suitable supply voltage level for a field exciter and to reduce the voltage ripple. For each 3-phase field exciter an autotransformer is dimensioned individually.
Placing the transformer inside the cabinet depends on the size of the transformer. For dimensioning please contact ABB. Higher input voltages (> 600 V / 690 V) require an insulating transformer.

<table>
<thead>
<tr>
<th>Unit type</th>
<th>DC I</th>
<th>Power loss</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>525 V</td>
<td>A</td>
<td>kW</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0020-05-C</td>
<td>16</td>
<td>0.58</td>
<td>D1</td>
</tr>
<tr>
<td>DCS800-F02-0025-05-C</td>
<td>22</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0045-05-C</td>
<td>40</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>DCS800-F02-0050-05-C</td>
<td>45</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0065-05-C</td>
<td>57</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>DCS800-F02-0075-05-C</td>
<td>67</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0090-05-C</td>
<td>84</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>DCS800-F02-0100-05-C</td>
<td>92</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0180-05-C</td>
<td>160</td>
<td>1.40</td>
<td>D2</td>
</tr>
<tr>
<td>DCS800-F02-0200-05-C</td>
<td>180</td>
<td>1.40</td>
<td></td>
</tr>
<tr>
<td>DCS800-F01-0315-05-C</td>
<td>285</td>
<td>1.81</td>
<td>D3</td>
</tr>
<tr>
<td>DCS800-F02-0350-05-C</td>
<td>300</td>
<td>1.81</td>
<td></td>
</tr>
</tbody>
</table>

Direction of 3-phase exciter DCS800-A0x-1900 ... 5200 (D6/D7)

Single line diagram DCS800-A-1900 (D6) ... 5200 (D7) including field supply

Single line diagram 1900 ... 5200 units with 3-phase field
Incoming Supply Sections for Line-ups DCA63x

Incomings DCA63x are described in options for converters. These cabinets must only be selected if the drive system consists of group drives from 20 up to 2000 A since these converters are supplied by horizontal busbars.

In the incoming supply section (DCA63x) only busbars are used. The connection to the AC supply can be made by cables or busbars. The cable / busbar entry is at the bottom of the incoming supply section.

Cable or busbar connection for 1000 A and 2000 A is standard.

Cable connection for 3000 A and 4000 A is on request, busbar connection is standard.

The cabinets standard protection class is IP21.

Basic design

Rated voltage: 400 V, 500 V, 600 V, 690 V
Rated frequency: 50 Hz or 60 Hz
Rated current: 1000 A, 2000 A, 3000 A, 4000 A
Short circuit ratings: 50 kA (1 sec.)
idyn= 105 kA (peak)

Note: AC horizontal busbars for 4000 A are not available. The 4000 A incoming supply section must be located in the middle of the line-up.

Cabinet Modifications for Incoming Supply Sections DCA630, 631, 632

CE mark

Requires options for EMC regulation and cable marking.

- EMC procedure according to part list check
  see section DCS800-A Mechanical options
- Marking of conductors
  see section DCS800-A Mechanical options
- Standard: (not sufficient for CE mark):
  see section DCS800-A Mechanical options
- Class A2 Plus: Special Marking according to EN60204-1
  see section DCS800-A Mechanical options
- Class B1: Special Marking
  see section DCS800-A Mechanical options

EMC filters in separate EMC-cabinets next to incoming cabinet (DCA640)

- 400 ... 500 V AC, 320 ... 600 A AC
- 600 ... 690 V AC, 600 ... 2500 A AC

Please select size of filters according to sum of all rated converter currents minus 10 %. The current mentioned above is the nominal current (Irms) on the line side.

- Instead of EMC filters a dedicated transformer can be used.

Bottom plate with conductive sleeves

Bottom plate are equipped with conductive sleeves which provide simple cable screen connection.

Insulation monitor IDRH 275-4 (A90) earth fault detection for isolated (IT) networks

An insulation monitoring device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated. This option includes a 230 V transformer.

For detection of earth faults in both DC and AC circuits. The insulation monitor can be mounted inside the cabinet or at the door (DCA630, 631, 632).
AC current measurement
- 3-phase (meters and current transformers)
  All three phases are monitored by means of current transformers and meters. Location of the meters is in the door of the incoming supply section.

AC voltage measurement
- Meter and a switch
  All three phases are monitored by means of a switch and a meter. Location of the switch and the meter is in the door in the incoming supply section. No transformers are used.
- With voltage transformers
  Voltage transformers are included for AC voltages above 660 V.

Arc detecting
- An arc detecting relay is used to supervise the AC bus bars. The type TVOC can handle up to 9 detectors.
- Detecting elements with fibre optic cable lengths of 2 to 20 m are available. It is possible to supervise several spots in one line-up.
- Overcurrent relay for arc detecting
  An overcurrent relay is used in combination with an arc detecting relay to eliminate false trips. The overcurrent relay can use the current transformers used by the measurement circuits. For example if an AC current measurement is used there is no need for extra current transformers for the overcurrent relay.
- If no AC current measurement is used, three current transformers are needed for the overcurrent relay.
- Location in separate 400 mm cabinet for DCA631 and DCA 632

Anticondensation heater of incoming section
- 50 W heater to prevent condensation.
  Supplied by 230 VAC from customer via terminals (X19)

Branching unit NDBU-95
The branching unit for DriveWindow and channel 0 optical networks can be located inside the incoming supply DCA630, 631, 632 (max. 2).
- NDBU-95
- NPSM-01 24 VDC power supply is required

Lighting of the cabinet
- LED lighting, including door contact. Supplied by 230 VAC / 115 VAC from customer via terminals (X19).

End panel left or right
Isolation switch option (for DCA631)
option for insulation switch
- Electrical interlocking
  It is possible to have an interlocking between isolating switch and earthing switch. Therefore the isolating switch needs an interlocking coil.

Circuit breaker option (for DCA632)
The circuit breaker is equipped with
- Overcurrent detection
- Undervoltage detection
- Auxiliary contacts (2 NC, 2 NO)

Earthing switch
available for 1000 A, 2000 A, 3000 A supply
- Switch
  An earthing switch can be used to ground the AC busbars to earth for safety reasons when work must be done in the line-up.
- Electrical interlocking
  It is possible to have an electrical interlocking between an earthing switch and a supply side isolating switch or circuit breaker. Therefore the earthing switch needs an interlocking coil.
Incoming DCA630 (without switch)

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

Note 2: Available in 1000 A, 2000 A, 3000 A and 4000 A - AC
Incoming DCA631 (isolation switch)

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

Note 2: Available in 1000 A, 2000 A and 3000 A - AC
Incoming DCA632 (circuit breaker)

Single line diagram Incoming DCA632

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

Note 2: Available in 1000 A, 2000 A, 3000 A and 4000 A - AC
Incoming DCA635 (without switch and options)

Single line diagram Incoming DCA635

Note 1: Dimensions see table 2, section Dimensions Converter cabinet

Note 2: Available in 1000 A, 2000 A and 3000 A - AC
DCS800-A2x

These converters are intended to supply high inductive loads like motor fields or chokes. They are equipped with three phase DCS800-S01 or DCS800-S02 converter modules plus DCF506 over voltage protection.

Options

Auto- and insulating transformers

An autotransformer is used to have a suitable supply voltage level for a field exciter and to reduce voltage ripple. For each 3-phase field exciter an autotransformer is dimensioned individually.

For dimensioning please contact ABB Automation Products GmbH, Ladenburg, Germany.

Higher input voltages (> 600 V / 690 V) require an insulating transformer.

Basic equipment

Degree of protection IP 21
Converter module U1
Line reactor L1
Transformer T2 only if required
Overvolt. protect. DCF506
I/O board SDCS-IOB-2x
I/O board SDCS-IOB-3
Fuses auxiliary supply F2
Auxiliary relays K8, K15, K16
Isolation switch Q1
Main contactor K1
Panels and Metering

Control panel in the door
- DCS800 control panel is always mounted on converter module inside the cabinet as standard
- Control panel socket on cabinet door for DCS800 control panel is an option

Meters in the door
- Analog meters
  Armature current meter - analog output drive
  Armature voltage meter - DC motor connection
- Third meter
  The third meter is connected to AO1 of the converter (e.g. excitation current)

Buttons in the door
- Emergency stop
  Stop category 1
  Safety category according to EN 954 B
- Electrical disconnect (coast stop)
  Stop category 0
  Function opens all main contactors of the line-up and blocks the firing pulses of each converter allowing the motors to coast stop.

**Note:** Only one of the buttons, emergency stop or electrical disconnect, can be chosen at the same time.

Insulation monitor IDRH 375-4 (A90) earth fault detection for isolated (IT) networks.
An insulation monitoring device can be used to continuously measure the insulation status in an unearthed network. The insulation monitor is installed between mains and protective earth (PE). If the insulation resistance is below adjusted values output relays are activated. Type IDRH 375 is used for door mounting.
For detection of earth faults in both DC and AC circuits. Available for converter ratings 900 ... 5200 A, size D5 ... D7 and incomings (DCA630, 631, 632).
Fieldbus adapter modules
- R fieldbus adapter modules are available for different serial communications for control purposes
  • PROFIBUS-DP
  • DeviceNet
  • CANopen
  • ControlNet
  • Modbus
  • Ethernet
The adapters are located direct on the converter module.

Advant controller and S800 I/O System
The S800 I/O system consists of the control module (FCI, AC 800M), digital and analog I/O modules. The control module has a connection to several different bus systems and optical channels to connect the drives. The modules are mountable on mounting rails (DIN).

Note: see S800 User Guide (Doc no. 3BSE008878)

AF 100 field bus interface FCI
Within this AF 100 interface up to 12 drives can be connected.

Advant controller AC 800M
Powerful controller with several fieldbus interfaces. Drives can be connected with the optical module bus or optical Drive Bus (CI 858) or via Profibus (CI 851).

The above mentioned control modules can also handle up to 12/24 I/O modules.

Digital inputs and outputs
  8 channels, input voltages from 24 V ... 250 V
  Analog inputs and outputs (12 bit resolution) 8 channels

Engineering Tool for Individual Programming
The Advant controller (AC 800M) are programmable controllers using ContolIT Control Builder.

- Graphical editor for creating and modifying program diagrams
- Function-oriented engineering
- Windows-based application programming
- Online editing
- Constant and parameter value changes
- Connection changes
- Deleting/Inserting function blocks or tasks
- Program downloading to AC 800M
- Temporary change of input terminal values
- Displaying actual values from terminals
DCA650 - Control cabinet
- S800 option in a control cabinet:
  - CI810 (FCI)
  - PM864 (AC 800M)
  - +24 V power supply internal
  - NDBU-95 branching unit
  - Full range S800 I/O modules
  - AF 100 connection
  - Clusters extended and compact socket horizontal located
  - Clusters extended socket vertical located
  - Cabinet widths: 600, 800 mm
The DCA650 control cabinet is designed to control several drives assembled in one line-up. To control processes with many input and output signals the S800 I/O's can be included. The design is splitted in two different layouts:

**Horizontal clusters:** This layout is recommend for short clusters with compact sockets. The process terminal are located at the side panel.

![DCA650 control cabinet with horizontal clusters](image)

**Vertical clusters:** This layout is recommended for long clusters with extended sockets normally without process terminals.

![DCA650 control cabinet with vertical clusters](image)

The standard design of this control cabinet takes care of the amount of control cables and EMC requirements (shielded connection) which limits the amount of S800 I/O modules.

**S800 I/O, horizontal location**
The upper area is reserved for power supply, fuses and other control circuits.
The lower area is prepared for maximum three clusters. The amount of S800 sockets depends on the cabinet size.

<table>
<thead>
<tr>
<th>600 mm</th>
<th>800 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible layouts per cluster</td>
<td>2 extended sockets + / 4 extended sockets +</td>
</tr>
<tr>
<td></td>
<td>advant controller / advant controller</td>
</tr>
<tr>
<td>Process /control cable entry</td>
<td>6 wholes D = 55 mm / 6 wholes D = 55 mm</td>
</tr>
<tr>
<td></td>
<td>2 slots 250 mm x 20 mm / 2 slots 250 mm x 20 mm</td>
</tr>
</tbody>
</table>

Instead of an advant controller one extended or two compact sockets can be used.
The control cables are fixed to the side panel.
The process terminals are an option and also located at the side panel.
Maximum amount of process terminals:
- 250 terminals without the horizontal busbar option
- 140 terminals in combination with the horizontal busbar option because the back panel is moved to the front (e.g. group drive).

**S800 I/O, vertical location**
This option is only possible together with extended sockets. The AC 800M controller must be located in the top cluster and connected via TB 820 interface.
The upper area is reserved for power supply, fuses and AC 800M clusters (+Drive Bus module).
The lower area is prepared for clusters and for the process cable wiring. The amount of S800 clusters depends on the cabinet size.

<table>
<thead>
<tr>
<th>600 mm</th>
<th>800 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible layouts</td>
<td>1 cluster / 2 clusters</td>
</tr>
<tr>
<td></td>
<td>7 extended sockets + / 7 extended sockets +</td>
</tr>
<tr>
<td></td>
<td>TB 820 Modul bus interf. / TB 820 Modul bus interf.</td>
</tr>
<tr>
<td></td>
<td>1 cluster / 1 cluster</td>
</tr>
<tr>
<td>Process /control cable entry</td>
<td>6 wholes D = 55 mm / 6 wholes D = 55 mm</td>
</tr>
<tr>
<td></td>
<td>2 slots 250 mm x 20 mm / 2 slots 250 mm x 20 mm</td>
</tr>
</tbody>
</table>

The amount of process terminals is limited to 180

**Attention:** The combination with the horizontal busbar option is not possible. So the cabinet must be located at the end of the line-up.
Process terminals
The need of process terminals depends on:
- customer requirements
- selected sockets
- selected control voltage

Extended sockets
Extended sockets can supply the process with 24 V control voltage and analog supply voltage.

Therefore these sockets give the advantage to avoid process terminals in case of 24 V digital signals and analog circuits.

For 115 V and 230 V control circuit - process terminals are needed in every case.

Options
Process power supply
On request.
This power supply is needed to supply all process devices outside the cabinet. The rated power and rated voltage of the active process devices must be considered.

Shielding busbar
Shielding busbar is an option and used for small shielded control and process cables. The cable shielding of the control and process cables must be connected. Shielding of very thick cables should be connected at the cable entry.

Note: see Installation manual doc.no 3ADW000091.
Small cable can also be connected at a shielding busbar located in parallel to the terminals.

Other mechanical options
see chapter 3
- Horizontal busbars
- EMC bottom plate
- Cable marking A2 plus

Compact sockets
Compact sockets have smaller size, but process terminals are recommended.
Environmental conditions

<table>
<thead>
<tr>
<th>System connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage, 3-phase: 230 to 1000 V acc. to IEC 60038</td>
</tr>
<tr>
<td>Voltage deviation: ± 10 % continuous; ± 15 % short-time *</td>
</tr>
<tr>
<td>Rated frequency: 50 Hz or 60 Hz</td>
</tr>
<tr>
<td>Static frequency deviation: 50 Hz ± 2 %; 60 Hz ± 2 %</td>
</tr>
<tr>
<td>Dynamic: frequency range: 50 Hz ± 5 Hz; 60 Hz ± 5 Hz</td>
</tr>
<tr>
<td>df/dt: 17 % / s</td>
</tr>
<tr>
<td>* = 0.5 to 30 cycles.</td>
</tr>
</tbody>
</table>

Please note: Special consideration must be taken for voltage deviation in regenerative mode.

Environmental limit values

Permissible cooling air temperature:
- at converter module air inlet: 0 to +55°C
- with rated DC current: 0 to +40°C
- with different DC current: +30 to +55°C
- Options: 0 to +40°C

Relative humidity (at 5 to +40°C): 5 to 95 %, no condensation
Relative humidity (at 0 to +5°C): 5 to 50 %, no condensation
Change of the ambient temp.: < 0.5°C / minute
Storage temperature: -40 to +55°C
Transport temperature: -40 to +70°C
Pollution degree (IEC 60664-1, IEC 60439-1):
- 2

Site elevation
- < 1000 m above M.S.L.: 100 %, without current reduction
- > 1000 m above M.S.L.: with current reduction

North American Standards

In North America the system components fulfil the requirements of the table below.

<table>
<thead>
<tr>
<th>Rated supply voltage</th>
<th>Standards</th>
<th>Enclosed converter</th>
</tr>
</thead>
<tbody>
<tr>
<td>to 600 V</td>
<td>UL 508 C</td>
<td>UL/CSA types: on request</td>
</tr>
<tr>
<td></td>
<td>Power Conversion Equipment CSA C 22.2 No. 14-95 Industrial Control Equipment, Industrial Products Available for converter modules including field exciter units. Types with UL mark: • see UL listing <a href="http://www.ul.com">www.ul.com</a> / certificate no. E196914 • or on request</td>
<td></td>
</tr>
<tr>
<td>&gt; 600 V to 1000 V</td>
<td>EN / IEC xxxx see table below, EN / IEC types: on request (for details see table below)</td>
<td></td>
</tr>
</tbody>
</table>

Paint finish

Converter module: RAL 9002
Enclosed converter: light grey RAL 7035

Sound pressure level

<table>
<thead>
<tr>
<th>Size</th>
<th>Sound pressure level Lp (1 m distance)</th>
<th>Vibration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>as module</td>
<td>as module</td>
</tr>
<tr>
<td>D1</td>
<td>55 dBA</td>
<td>68 dBA</td>
</tr>
<tr>
<td>D2</td>
<td>55 dBA</td>
<td>72 dBA</td>
</tr>
<tr>
<td>D3</td>
<td>60 dBA</td>
<td>78 dBA</td>
</tr>
<tr>
<td></td>
<td>0.5 g, 5 ... 55 Hz</td>
<td></td>
</tr>
<tr>
<td>D4</td>
<td>86 ... 70 dBA, depending on fan</td>
<td>77 dBA</td>
</tr>
<tr>
<td>D5</td>
<td>73 dBA</td>
<td>78 dBA</td>
</tr>
<tr>
<td></td>
<td>1 mm, 2 ... 9 Hz</td>
<td></td>
</tr>
<tr>
<td>D6</td>
<td>75 dBA</td>
<td>73 dBA</td>
</tr>
<tr>
<td></td>
<td>0.3 g, 9 ... 200 Hz</td>
<td></td>
</tr>
<tr>
<td>D7</td>
<td>82 dBA</td>
<td>80 dBA</td>
</tr>
</tbody>
</table>

Regulatory compliance

The converter module and enclosed converter components are designed for use in industrial environments. In EEA countries, the components fulfill the requirements of the EU directives, see table below.

<table>
<thead>
<tr>
<th>European union directive</th>
<th>Manufacturer's assurance</th>
<th>Harmonized standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Converter module</td>
<td>Enclosed converter</td>
</tr>
<tr>
<td>Machinery Directive</td>
<td>Declaration of Incorporation</td>
<td>EN 60204-1</td>
</tr>
<tr>
<td>98/37/EEC</td>
<td>[IEC 60204-1]</td>
<td>EN 60204-1</td>
</tr>
<tr>
<td>93/68/EEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Voltage Directive</td>
<td>Declaration of Conformity</td>
<td>EN 60146-1-1</td>
</tr>
<tr>
<td>73/23/EEC</td>
<td>[IEC 60146-1-1]</td>
<td>EN 60204-1</td>
</tr>
<tr>
<td>93/68/EEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC Directive</td>
<td>Declaration of Conformity</td>
<td>EN 61800-3</td>
</tr>
<tr>
<td>89/336/EEC</td>
<td>[IEC 61800-3]</td>
<td>EN 61800-3</td>
</tr>
<tr>
<td>93/68/EEC</td>
<td>(Provided that all installation instructions concerning cable selection, cabling and EMC filters or dedicated transformer are followed.)</td>
<td>[IEC 61800-3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EN 61800-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in accordance with 3ADW000032</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[IEC 61800-3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in accordance with 3ADW000032 / 3ADW000091</td>
</tr>
</tbody>
</table>
DCS800-A Enclosed Converter unit types

<table>
<thead>
<tr>
<th>Unit type</th>
<th>DC I * ratings</th>
<th>DC II current</th>
<th>DC III current</th>
<th>DC IV current</th>
<th>int. field</th>
<th>Power loss</th>
<th>Frame size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCS800-A01-0050-10-D</td>
<td>100</td>
<td>180</td>
<td>210</td>
<td>250</td>
<td>0.80</td>
<td>2.50</td>
<td>25</td>
</tr>
<tr>
<td>DCS800-A01-0100-10-D</td>
<td>200</td>
<td>360</td>
<td>420</td>
<td>500</td>
<td>1.60</td>
<td>4.60</td>
<td>40</td>
</tr>
<tr>
<td>DCS800-A01-0200-10-D</td>
<td>400</td>
<td>720</td>
<td>840</td>
<td>1000</td>
<td>3.20</td>
<td>9.20</td>
<td>60</td>
</tr>
<tr>
<td>DCS800-A01-0400-10-D</td>
<td>800</td>
<td>1440</td>
<td>1700</td>
<td>2000</td>
<td>6.40</td>
<td>18.40</td>
<td>80</td>
</tr>
<tr>
<td>DCS800-A01-0800-10-D</td>
<td>1600</td>
<td>3000</td>
<td>3600</td>
<td>4400</td>
<td>12.80</td>
<td>36.80</td>
<td>120</td>
</tr>
</tbody>
</table>

DCS800-A enclosed converters are suitable for three-phase supply voltages from 230 ... 990 (1200) V

There is a nominal supply voltage and the rated DC current.

Load cycles

**DC I**
- **I<sub>loc</sub>** continuous (I<sub>loc</sub>)
- **I<sub>loc</sub>** for 15 min and 1.5 * **I<sub>loc</sub>** for 60 sec.

**DC II**
- **I<sub>loc</sub>** for 15 min and 1.5 * **I<sub>loc</sub>** for 2 min and 10 sec.

Enclosed 3-phase Field exciters

**Table 1: DCS800-A types**

<table>
<thead>
<tr>
<th>Voltage class</th>
<th>Example: DCS800-A01-0025-04-D</th>
<th>04</th>
<th>06</th>
<th>09</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 V</td>
<td>500 V</td>
<td>525 V</td>
<td>600 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 V</td>
<td>500 V</td>
<td>525 V</td>
<td>600 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 V</td>
<td>800 V</td>
<td>1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 V</td>
<td>800 V</td>
<td>1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 V</td>
<td>1500 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Ratings are valid for IP 21; for IP 31 and IP 41 the current derating is calculated by drive power.

**Table 3: DCS800-A types**

<table>
<thead>
<tr>
<th>Voltage class</th>
<th>Example: DCS800-A01-0025-04-D</th>
<th>04</th>
<th>06</th>
<th>09</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 V</td>
<td>525 V</td>
<td>600 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 V</td>
<td>800 V</td>
<td>1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 V</td>
<td>1500 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Ratings are valid for IP 21; for IP 31 and IP 41 the current derating is calculated by drive power.

**Table 5: DCS800-A types**

<table>
<thead>
<tr>
<th>Voltage class</th>
<th>Example: DCS800-A01-0025-04-D</th>
<th>04</th>
<th>06</th>
<th>09</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 V</td>
<td>525 V</td>
<td>600 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 V</td>
<td>800 V</td>
<td>1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 V</td>
<td>1500 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Ratings are valid for IP 21; for IP 31 and IP 41 the current derating is calculated by drive power.

DCS800-A Enclosed Converters Technical catalog e e | 3ADW000198R0501 | 43
Dimensions converter cabinet

### Table 2: Dimensions of the DCS800-A series.

<table>
<thead>
<tr>
<th>DCS800-A0x-0620-04/05-D</th>
<th>2120 600 600 600 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCS800-A0x-0900-06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-1200-04/05-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-1500-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-2000-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-2500-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-3000-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-3500-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
<tr>
<td>DCS800-A0x-4000-06/06/07-D</td>
<td>2120 600 1400 1400 710</td>
</tr>
</tbody>
</table>

**Notes:**

- All dimensions are in mm
- Please add for each end panel 15 mm and for a door (without buttons) 20 mm

- Height is including detachable hood (120 mm)
- with circuit breaker or contactor
- without circuit breaker or contactor
- DCS800-A with AC supply voltage 3 x 800 V ... 1200 V or current ≥ 3300 A are generally without circuit breaker.
- Max length of a shipping split is 3.40 m. If the line-up width is longer than 3.40 m busbar joining cabinets are required.
- at 600 V (6) and 690 V (7) only available as 2-Q converter
- z: Weight for busbars: 1000 A / 2000 A = 35 kg/m; 3000 A = 70 kg/m
- The air circuit breaker stands out of the line-up's front.
- Thus 78 mm, Size D3, are added to the total depth of the line-up.
- **Fans according new ErP high efficiency compliance. Fans are designed for typical Aux supply 400 V, 500 V, 50 Hz and 460 V, 60 Hz. Other aux supply for fans on request.**

### Fan data

<table>
<thead>
<tr>
<th>Fan type</th>
<th>Air volume freely blowing [m³/h]</th>
<th>Converter size</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x CN2B2</td>
<td>320 360</td>
<td>D1  D2  D3</td>
</tr>
<tr>
<td>4x CN2B2</td>
<td>640 720</td>
<td>D4  D5  D6</td>
</tr>
<tr>
<td>W2E200</td>
<td>925 1030</td>
<td>D4  D5  D6</td>
</tr>
<tr>
<td>W2E200</td>
<td>925 1030</td>
<td>D4  D5  D6</td>
</tr>
<tr>
<td>W2E250</td>
<td>1860 1975</td>
<td>D4  D5  D6</td>
</tr>
<tr>
<td>W2E250</td>
<td>1860 1975</td>
<td>D4  D5  D6</td>
</tr>
<tr>
<td>R2E250</td>
<td>800 750</td>
<td>D5  D6</td>
</tr>
<tr>
<td>GR28C</td>
<td>1500 1600</td>
<td>D5  D6</td>
</tr>
<tr>
<td>GR35C</td>
<td>4200 4500</td>
<td>D7  D8</td>
</tr>
<tr>
<td>GR35C</td>
<td>4200 4500</td>
<td>D7  D8</td>
</tr>
</tbody>
</table>

* air outlet as air duct interface available
** Fans according new ErP high efficiency compliance. Fans are designed for typical Aux supply 400 V, 500 V, 50 Hz and 460 V, 60 Hz. Other aux supply for fans on request.

#### Incoming Supply Sections

<table>
<thead>
<tr>
<th>DCA63u-1000-05/06/06 D</th>
<th>2120 600 600 600 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCA63u-2000-4/5/6/7 D</td>
<td>2120 600 600 600 300</td>
</tr>
<tr>
<td>DCA63u-3000-4/5/6/7 D</td>
<td>2120 600 600 600 300</td>
</tr>
<tr>
<td>DCA63u-4000-4/5/6/7 D</td>
<td>2120 600 600 600 300</td>
</tr>
<tr>
<td>Busbar joining cabinet</td>
<td>2120 600 200 200 300</td>
</tr>
</tbody>
</table>

#### Notes:

x=1 ⇒ 2-Q converter  
x=2 ⇒ 4-Q converter  
x=3 ⇒ 6-Q converter  
x=4 ⇒ 8-Q converter  
x=5 ⇒ 10-Q converter  

- incoming without switch  
- incoming with insulation switch  
- incoming with circuit breaker  

- Voltage class: (example: DCS800-A0x-0025-04-D)  
  04 ⇒ 400 V  
  05 ⇒ 500/525 V  
  06 ⇒ 600 V  
  07 ⇒ 690 V  
  08 ⇒ 800 V  
  10 ⇒ 990 V  
  12 ⇒ 1200 V

- P ⇒ hard parallel (two conv. mod. in parallel)  
  - u=0 ⇒ incoming without options  
  - u=5 ⇒ incoming options  

- **Fans according new ErP high efficiency compliance. Fans are designed for typical Aux supply 400 V, 500 V, 50 Hz and 460 V, 60 Hz. Other aux supply for fans on request.**
Basic diagram without electrical options
Note: Converters with rated voltage > 690 V AC are always equipped with separate auxiliary-, fan- and field exciter supply voltage input (see single line diagrams).
Quality dimensioning
DriveSize is a PC program for helping the user to select an optimal converter and options, especially in those cases where a straightforward selection from a catalog is not possible. Documents about the dimensioning based on actual load.

The default values make DriveSize simple to use, but the user is provided with many options for drive selection. The shortcut keys make drive selection easy while still honouring the relatively complicated rules. A manual selection mode is also supported.

DriveSize is currently used by more than 1000 engineers globally.

DriveSize is for drive system components
- DCS converter modules
- DCS enclosed converters
- Group drives (line-ups)
- Drive options

DriveSize features
- Select an drive unit, incoming unit
- Calculate duty load cycles for converters
- Supply dimensioning results in graphical and numerical format
- Print and save the results
DCS800-A Safety option ordering

DCS800-A0X Cabinet with Contactor, AC Breaker or DC Breaker
ABB offers following options to help the system integrator to fulfill customer’s safety regulations

Exclusion of liability
ABB is not responsible for the implementation, verification and validation of the overall safety system. It is the responsibility of the system integrator (or other party) who is responsible for the overall system and system safety. The system integrator (or other responsible party) must make sure that the entire implementation complies with all relevant standards, directives and local electrical code, and that the system is tested, verified and validated correctly.

Coast Stop Function (non safety related) K16 timer + Electrical Stop function (non safety related) K15 timer

Option Stop Category 0
Option 1: +S951 STO (please check if below options are needed)
Description: Safe Torque OFF (STO) function prescribed in IEC/EN60204-1, Stop Category 0 (Uncontrolled Stop) and compliant with Functional Safety Standard.
Response time: 500 ms or less (from input to the terminal to Safe Torque OFF)
Safety integrity level (SIL): 2
Category: 3
Performance level (PL): PL-d (if Main Contactor (AC), High Speed DC Breaker or Sace E-Max (ACB) is used)
Pollution degree: max. 2
Hardware: A14 STO safety relay

Option 1.1 +S952: STO plus automatic start function!
ATTENTION - AUTOMATIC START
According to IEC/EN 60204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop. Therefore the machine control has to disable the automatic start after emergency stop.
Hardware: Automatic start circuit; basic option 1 (+S951) required
not in combination with option 1.4 (+S955)

Option 1.2 +S953 E-STOP cat 0 button in cabinet door;
Option 1.3 +S954 Prevention of start up indication lamp in cabinet door;
Option 1.4 +S955 STO Reset button in door;
Option 1.5 +S956 STO mechanically coupled motors;
Option 1.9 +S957 STO plus duplicating for up to 50 drives (e.g. for rollertables)

Safe Torque OFF (STO) function prescribed in IEC/EN60204-1, Stop Category 0 (Uncontrolled Stop) and compliant with Functional Safety Standard.

<table>
<thead>
<tr>
<th>Total number of Drives up to:</th>
<th>Needed Pluscode ordering for +S957</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>8</td>
<td>1 x +S957</td>
</tr>
<tr>
<td>14</td>
<td>2 x +S957</td>
</tr>
<tr>
<td>20</td>
<td>3 x +S957</td>
</tr>
<tr>
<td>26</td>
<td>4 x +S957</td>
</tr>
<tr>
<td>32</td>
<td>5 x +S957</td>
</tr>
<tr>
<td>38</td>
<td>6 x +S957</td>
</tr>
<tr>
<td>44</td>
<td>7 x +S957</td>
</tr>
<tr>
<td>50</td>
<td>8 x +S957</td>
</tr>
</tbody>
</table>
Option Stop Category 1

Time based Safe Stop 1 (SS1) function prescribed in IEC/EN60204-1, Stop Category 1 (ramped stop) and compliant with functional Safety Standard

- **Option 2.1 +S961**  
  Ramped Stop time level 1 ... 10 s

- **Option 2.2 +S962**  
  Ramped Stop time level 3 ... 30 s

- **Option 2.3 +S963**  
  Ramped Stop time level 30 ... 300 s

Response time: 60 ms or less from input to the terminal to trigger the 0 to 300 s (as set by Safety timer relay) for ramped stop and additionally 500 ms or less (from input to the terminal to Safe Torque OFF)
Safety integrity level (SIL): 2
Category: 3
Performance level (PL): PL-d (if Main Contactor (AC) or High Speed DC Breaker is used) and PL-c (if Sace E-Max (ACB) is used)
Pollution degree: max. 2
Hardware: A15 SS1 safety timer relais; basic STO option 1 (+S951) required (A14 safety relais)

- **Option 2.4 +S964**  
  Time based Safe Stop 1 (SS1) function prescribed in IEC/EN60204-1, Stop Category 1 (ramped stop), automatic start and compliant with functional Safety Standard

  ATTENTION - AUTOMATIC START!
  According to IEC/EN 60204-1 part 9.2.5.4.2 and 10.8.3 it is not allowed to restart automatically after emergency stop.
  Therefore the machine control has to disable the automatic start after emergency stop.
Hardware:  
  Automatic start circuit; basic option 2.x (+S961 or +S962 or +S963) required not in combination with option 2.6 (+S966)

- **Option 2.5 +S965**  
  E-stop cat 1 push button in cabinet Door
  basic option 2.x (+S961 or +S962 or +S963) required
  not in combination with option 2.6 (+S966)

- **Option 2.6 +S966**  
  SS1 reset button in cabinet door; not in combination with option 2.4 (+S964)
  basic option 2.x (+S961 or +S962 or +S963) required

- **Option 2.7 +S967**  
  OFF3 acknowledge of drive; basic option 2.x (+S961 or +S962 or +S963) required

- **Option 2.8 +S968**  
  SS1 common for multiple drives;
  Hardware:  
  A15.2 safety contact multiplier; basic option 2.x (+S961 or +S962 or +S963) required
  Option SS1 common (+S968) requires option STO (+S951) in each individual drive. The interface between individual drive and SS1 circuit X95 bus is used.

<table>
<thead>
<tr>
<th>Total number of Drives up to:</th>
<th>Needed Pluscode ordering for +S968</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>8</td>
<td>1 x +S968</td>
</tr>
<tr>
<td>14</td>
<td>2 x +S968</td>
</tr>
<tr>
<td>20</td>
<td>3 x +S968</td>
</tr>
<tr>
<td>26</td>
<td>4 x +S968</td>
</tr>
<tr>
<td>32</td>
<td>5 x +S968</td>
</tr>
<tr>
<td>38</td>
<td>6 x +S968</td>
</tr>
<tr>
<td>44</td>
<td>7 x +S968</td>
</tr>
<tr>
<td>50</td>
<td>8 x +S968</td>
</tr>
</tbody>
</table>

No DCS800-A Safety Option
- **Customer specified safety function**
  Description: Circuit diagrams and components according Customer specification
When ordering your DCS800-A or external field exciter, please specify the type code according to the type code tables.

Type code table for DCS800-A0x drives cabinets

Type code table for DCS800-A2x 3-phase field exciters in a separate cabinet

Type code table for DCA63x incoming cabinets

Type code table for DCS800-F0x 3-phase field exciter in the armature cabinet 1900 A (D6) ... 5200 A (D7)

Type code table for DCF80x 2-phase field exciters (up to 50 A) in the armature cabinet

Note: Order control cabinet with: DCA650
Order empty cabinet with: DCA680
DCS family

**DCS550-S modules**
The compact drive for machinery application

- Compact
- Robust design
- Adaptive and winder program
- High field exciter current

<table>
<thead>
<tr>
<th>Current</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>20 A</td>
<td>1,000 V</td>
</tr>
<tr>
<td>0 A</td>
<td>610 V</td>
</tr>
<tr>
<td>230 V</td>
<td>525 V</td>
</tr>
<tr>
<td>IP00</td>
<td></td>
</tr>
</tbody>
</table>

**DCS800-S modules**
The versatile drive for process industry

- Compact
- Highest power ability
- Simple operation
- Comfortable assistants, e.g. for commissioning or fault tracing
- Scalable to all applications
- Free programmable by means of integrated IEC61131-PLC

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<th>Current</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>20 A</td>
<td>5,200 V</td>
</tr>
<tr>
<td>0 A</td>
<td>1,160 V</td>
</tr>
<tr>
<td>230 V</td>
<td>1,000 V</td>
</tr>
<tr>
<td>IP00</td>
<td></td>
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</tbody>
</table>

**DCT880 Thyristor power controller**
Controlling electro-thermal processes

- Resistive and inductive loads, infrared heaters
- Phase angle, full wave burst and half wave mode
- U, I, P, I² control
- Clear text display with USB port
- Load monitoring
- For all typical load configurations star, delta, open delta, single phase, and multitap
- Reduces energy costs by power optimizer function

<table>
<thead>
<tr>
<th>Current</th>
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<tbody>
<tr>
<td>DC</td>
<td>AC</td>
</tr>
<tr>
<td>16 A</td>
<td>4,160 V</td>
</tr>
<tr>
<td>14 kW</td>
<td>5 MW</td>
</tr>
<tr>
<td>230 V</td>
<td>690 V (1200)</td>
</tr>
<tr>
<td>IP00</td>
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**DCS800-E series**
Pre-assembled drive-kits

- DCS800 module with all necessary accessories mounted and fully cabled on a panel
- Very fast installation and commissioning
- Squeezes shut-down-times in revamp projects to a minimum
- Fits into Rittal cabinets
- Compact version up to 450 A and Vario version up to 2,000 A

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<tbody>
<tr>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>20 A</td>
<td>2,000 V</td>
</tr>
<tr>
<td>0 A</td>
<td>700 V</td>
</tr>
<tr>
<td>230 V</td>
<td>600 V</td>
</tr>
<tr>
<td>IP00</td>
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**DCS800-R Rebuild Kit**
Digital control-kit for existing powerstacks

- Proven long life components are re-used, such as power stacks, (main) contactors, cabinets and cabling / busbars, cooling systems
- Use of up-to-date communication facilities
- Increase of production and quality
- Very cost-effective solution
- Open Rebuild Kits for nearly all existing DC drives
- tailor-made solutions for...
  - BBC PxD
  - BBC SZxD
  - ASEA TYRAK
  - other manufacturers

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<tbody>
<tr>
<td>DC</td>
<td>DC</td>
</tr>
<tr>
<td>20 A</td>
<td>20,000 V</td>
</tr>
<tr>
<td>0 A</td>
<td>1,160 V</td>
</tr>
<tr>
<td>230 V</td>
<td>1,200 V</td>
</tr>
<tr>
<td>IP00</td>
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